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Isolation and Identification of Microorganisms Found in the Ear, Nose and Throat of Students in University of Abuja Girls Hostel

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ABSTRACT

A study on the microorganisms found in the ear, nose and throat was carried out using 10 female Samples from the University of Abuja Girls Hostel to investigate the normal Flora and potential pathogens found in the ear, nose and throat. A total of 30 Samples were collected using a sterile swab stick and was labeled accordingly before taking them to the microbiology laboratory for identification. Microorganisms Isolated include: Staphylococcus aureus, Moraxella catarrhalis, Neisseria meningitidis, Streptococcus pyogenes and Streptococcus pneumoniae, Corynebacterium diphtherae. The results obtained revealed that Staphylococcus aureus has the highest prevalence in all the samples followed by Streptococcus pyogenes. In the throat Staphylococcus aureus had the highest percentage (55%). In the ear Staphylococcus aureus had the percentage (60%). So also in the nose (45%). Streptococcus pyogenes in the throat had a percentage of 25% and 15% in the nose.

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Introduction

The human orifices have formidable defense mechanism. The average person inhales at least 8 microorganisms in a minute and 10000 each day apart from the one injected through the other orifices such as the mouth and the ear. Once injected the microorganisms must first survive, brake through the defense mechanism of the vulnerable and penetrate through into the infected area. For the nose, the air filtration system of the upper and lower respiratory tract. Because the air flow in these tracts is very turbulent microorganisms are deposited in the moist, sicky, mucosal surface. Microorganisms which are larger than 10um are usually trapped by hairs, and cilia lining and the nasal cavity. The cilia in the nasal cavity beat towards the pharynx. So that the mucos with it's trapped microorganisms are moved towards the mouth and expelled [1].

Materials and Methods

Study Area

This study was carried out at in the university of Abuja permanent site girls hostel, Gwagwalada area council of F.C.T.

Sample Collection

A total number of 30 Samples of each ear, nose and throat were collected from each student using a sterile swab stick aseptically and taken to university of Abuja microbiology laboratory for biological analysis.

Materials

Sterile swab stick, nutrient agar, blood agar, petri dishes, foil paper, cotton wool, masking tape, methylated spirit, gram reagent, syringe, incubator, refrigerator.

Microbiological Analysis and Macroscopic Evaluation of Cultured Plate

The microbiological Analysis and macroscopic evaluation of cultured plate was carried out according to methods described by [2].

Biochemical Test

Gram reaction, citrate test, catalase test, coagulase test, motility test, indole test were carried out according to the method described by [3].

Starch Hydrolysis

This purpose is to know if the microbe can use starch. An innoculum of a pure culture was streaked on a sterile plate containing starch media. Innoculated plate was incubated at 37 degree Celsius for 24hours, Iodine reagent was then added. Presence of clear halos indicated positive the ability to digest starch and the presence of alpha amylase.

Results

Table 1: Bacteria Isolates from Ear, Nose and Throat of Students

	Nose		Ear		Throat	
Organisms	**Efficiency**	**Percentage**	**Efficiency**	**Percentage**	**Efficiency**	**Percentage**
Staphylococcus aureus	0.45	45	0.6	60	0.55	55
Streptococcus pyogenes	0.15	15	0.1	10	0.25	25
Streptococcus pneumoniae	0.05	5	0.05	5	0.05	5
Corynebacterium diphtherae	0.15	15	0.15	15	0.05	5
Moraxella catarrhalis	0.15	15	0.1	10	0.05	5
Neisseria meningitidis	0.05	5	-	-	0.05	5

Table 2: Morphology and Frequency by Number of Colony of Bacteria from Ear, Nose and Throat of Students

	Throat		Ear		Nose	
Organisms	**Morphology**	**Means of bacteria isolates**	**Morphology**	**Means of bacteria isolates**	**Morphology**	**Means of bacteria isolates**
Streptococcus pyogenes	Moist, mucoid, transparent, grey, beta-haemolysis	92	Small, semi transparent, grey, white, wide zone of hemolysis	72	White colony, glossy, rough edges, clear hemolysis	185
Streptococcus pneumoniae	Creamy, flat, smooth, circular	78	Creamy, flat, smooth, circular	132	Beta hemolysis, moist, mucoid, transparent	101
Corynebacterium diphtherae	Grey, opaque, weak, haemolysis	167	Dull, greyish, black, flat, weak haemolysis	163	Circular, small, granular, moist, creamy, irregular edges	117
Moraxella catarrhalis	Large, non pigmented, grey, opaque, smooth	98	Rhizoid, undulate, translucent, yellow	138		95
Neisseria meningitidis	Small, non haemolytic, convex, translucent	210		-	-	-
Staphylococcus aureus	Smooth, glistening, golden, yellow, beta-haemolysis	127	Creamy, smooth, whitish, beta hemolysis	147	Clear hemolysis, yellow, creamy, curled, glistening	167

Table 3: Biochemical Test Results of Bacteria Isolates

Isolates	Gram rxn	Catalase test	Coagulase test	Starch hydrolysis	Citrate utilization	Motility test	Oxidase test	Indole test
Staphylococcus aureus	+	-	+	-	+	-	-	-
Streptococcus pyogenes	+	-	-	+	-	-	-	-
Corynebacterium diphtherae	+	-	-	-	-	-	-	-
Streptococcus pneumoniae	+	-	-	+	-	-	-	-
Moraxella catarrhalis	-	-	-	+	-	-	-	-
Neisseria meningitidis	-	-	+	-	-	-	+	-

Discussion

In this study 30 Samples from ear, nose and throat were microbiologically examined and a total of 6 bacteria were examined which includes: Corynebacterium diphtherae, Staphylococcus aureus, Streptococcus pyogenes, Streptococcus pneumoniae, Neisseria meningitidis, and Moraxella catarrhalis. These organisms Isolated agree with study on the pathogenic microbiological flora recovered from the ear, nose and throat. Moraxella catarrhalis is an exclusive human pathogen and is a common cause of otitis media in infants. It is a common commensal organism of the upper respiratory tract. Staphylococcus aureus can cause many forms of infection like skin lesion and localized abscesses. It can also cause deep seated. infection like osteomyelitis and endocarditis. Corynebacterium diphtherae is a serious bacteria that affect the ear, nose and throat. Although spread easily from one person to another, the bacteria most commonly affect the nose and throat. Streptococcus pneumoniae can be harmless at low density when the concentration of these bacteria become high in it's host, it can cause infection. Streptococcus pyogenes has the potential to cause both mild and severe diseases. It has claimed many lives, while most people suffer from mild infection such as Strep. throat or impetigo during childhood to severe like necrotizing fasciitis and Streptococcus toxic shock syndrome, it is important to understand it's full pathogenic potential in other to know how to identify, treat and avoid these infections [4].

Conclusion

This research shows that ear, nose and throat inhabits microorganisms which belong to the natural microflora and was able to establish the prevalence of Staphylococcus aureus in all the samples which can become opportunistic in immunocompromized patients and which could also from the common habit of putting contaminated fingers into the ear and nose which are the common orifices prone to this unhealthy habits among students and the society at large. However, microbiological standard in hygiene is necessary for a healthy life.

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